IN THE CLAIMS

1. (Currently amended) A managing method to be executed by a management computer connected to a computer and to a storage apparatus through a network, said storage apparatus having plural logical devices, the managing method comprising the steps of:

allocating a ~~storage area~~ first logical device of predetermined capacity from a storage pool of unallocated logical devices of the ~~storage area of said~~ storage apparatus to said computer;

obtaining the capacity utilization of each ~~storage area~~ logical device allocated to said computer;

calculating an estimated future capacity utilization which is estimated from the capacity utilization of said each ~~storage area~~ logical device; ~~and~~

if the capacity of said allocated first logical device is greater than the estimated future capacity utilization by a determined amount, allocating a second logical device of predetermined capacity from the storage pool to said computer, releasing the allocation of the first logical device to said computer, and returning the first logical device to the storage pool, wherein the capacity of said second logical device is less than the capacity of said first logical device and greater than or equal to said estimated future capacity utilization; and ~~collecting a storage area in which the difference between the capacity of said allocated storage area and said estimated capacity utilization when the capacity of said allocated storage area is greater than said estimated capacity utilization~~

if the capacity of said allocated first logical device is greater than or equal to the estimated future capacity utilization but less than the sum of the estimated future capacity utilization plus the determined amount, retaining the allocation of said first logical device to said computer.

2. (Currently amended) The managing method according to claim 1, wherein ~~said collecting step includes the steps of:~~

~~allocating a second storage area of capacity equal to or greater than said estimated capacity utilization and smaller than the capacity of allocated first storage area to said computer; and~~

if the capacity of said allocated first logical device is greater than the estimated future capacity utilization by a determined amount, the managing method further comprises the step of copying data stored in said first logical device to said second logical device, wherein said copying step is completed before performing said step of releasing the allocation of said first ~~storage area~~ logical device to the computer ~~after the copying of data of said first storage area to said second storage area is terminated~~.

3. (Currently amended) The managing method according to claim 2, ~~wherein said collecting step further includes~~ further comprising the step of giving commands to said storage apparatus so as to execute the copying of the data of said first ~~storage area~~ logical device to said second ~~storage area~~ logical device.

4. (Currently amended) The managing method according to claim 3, ~~wherein said collecting step further includes~~ further comprising the step of reducing the size of a file system made in the first ~~storage area~~ logical device before the data copying is executed by the storage apparatus.

5. (Currently amended) The managing method according to claim 2, ~~wherein said collecting step further includes~~ further comprising the step of giving commands to said computer so as to execute the copying of the data of said first ~~storage area~~ logical device to said second ~~storage area~~ logical device.

6. (Canceled)

7. (Currently amended) The managing method according to claim 1, ~~wherein said collecting step further includes~~ further comprising the step of judging whether ~~collection of a storage area~~ releasing the allocation of the first logical device is possible on the basis of a flag ~~for every allocated storage area~~.

8. (Currently amended) The managing method according to claim 1, further ~~including a step~~ comprising the steps of:

obtaining a value indicating the number of write I/O operations of each ~~storage area~~ logical device allocated to said computer, and

~~said collecting step includes the steps of:~~

assigning ~~said storage area~~ each logical device having 0 as said write I/O number value for archive~~, and allocating a second storage area of low cost and having a capacity equal to or greater than said estimated capacity utilization and smaller than the capacity of said allocated first storage area to said computer; and~~

~~releasing the allocation of said first storage area to the computer after the copying of the data of said first storage area to said second storage area is terminated~~.

9. (Currently amended) The managing method according to claim 1,

wherein said management computer is connected to plural storage apparatuses each having plural logical devices, and said management computer includes a memory for ~~holding~~ storing a device management table for managing the allocating states of the ~~storage area~~ logical devices of each of said plural storage apparatuses ~~is provided~~, and

wherein said step of allocating said ~~storage area~~ first logical device to said computer ~~comprises allocating said storage area~~ allocates said first logical device to said computer on the basis of said device management table.

10. (Currently amended) The managing method according to claim 1, wherein

said step of calculating said estimated future capacity utilization ~~comprises calculating~~ calculates the estimated future capacity utilization on the basis of the kind of [[an]] application for utilizing each ~~storage area~~ logical device, access characteristics or the degree of importance of stored data in addition to the capacity utilization of said each ~~storage area~~ logical device.

11. (Currently amended) The managing method according to claim 1, wherein

on the basis of the capacity of said allocated ~~storage area~~ first logical device and said estimated future capacity utilization, a proper state of the capacity of said allocated first storage area is displayed.

12. (Currently amended) A managing program embodied on a computer-readable medium, said managing program to be executed by a management computer connected to a computer and to a storage apparatus having plural logical devices ~~a memory unit~~ through a network, for executing:

a procedure for allocating a ~~storage area~~ first logical device of predetermined capacity from a storage pool of unallocated logical devices of the ~~storage area of said~~ storage apparatus to said computer;

a procedure for obtaining the capacity utilization of each ~~storage area~~ logical device allocated to said computer;

a procedure for calculating an estimated future capacity utilization which is estimated from the capacity utilization of said each ~~storage area~~ logical device; ~~and~~

a procedure for allocating a second logical device of predetermined capacity from the storage pool to said computer, releasing the allocation of the first logical device to said computer, and returning the first logical device to the storage pool, if the capacity of said allocated first logical device is greater than the estimated future capacity utilization by a determined amount, wherein the capacity of said second logical device is less than the capacity of said first logical device and greater than or equal to the capacity of said estimated future capacity; and for retaining the allocation of said first logical device to said computer, if the capacity of said allocated first logical device is greater than or equal to the estimated future capacity utilization but less than the sum of the estimated future capacity plus the determined amount ~~collecting a storage area in which the difference between the capacity of said allocated storage area and said estimated capacity utilization when the capacity of said allocated storage area is greater than said estimated capacity utilization~~.

13. (Currently amended) A memory medium readable by a management computer connected to a computer and to a storage apparatus having plural logical devices through a network, and storing a managing program to be executed by the management computer, wherein ~~the memory medium stores~~ the managing program ~~for executing~~ comprises the following procedures:

a procedure for allocating a ~~storage area~~ first logical device of predetermined capacity from a storage pool of unallocated logical devices of the ~~storage area of said~~ storage apparatus to said computer;

a procedure for obtaining the capacity utilization of each ~~storage area~~ logical device allocated to said computer;

a procedure for calculating an estimated future capacity utilization which is estimated from the capacity utilization of said each ~~storage area~~ logical device; ~~and~~

a procedure for allocating a second logical device of predetermined capacity from the storage pool to said computer, releasing the allocation of the first logical device to said computer, and returning the first logical device to the storage pool, if the capacity of said allocated first logical device is greater than the estimated future capacity utilization by a determined amount, wherein the capacity of said second logical device is less than the capacity of said first logical device and greater than or equal to the capacity of said estimated future capacity; and for retaining the allocation of said first logical device to said computer, if the capacity of said allocated first logical device is greater than or equal to the estimated future capacity utilization but less than the sum of the estimated future capacity plus the determined amount ~~collecting a storage area in which the difference between the capacity of said allocated storage area and said estimated capacity utilization when the capacity of said allocated storage area is greater than said estimated capacity utilization~~.

14. (New) A managing method to be executed by a management computer connected to a computer and to a storage apparatus through a network, said storage apparatus having plural logical devices, the managing method comprising the steps of:

setting a lower limit securing ratio and an upper limit securing ratio in a data management table, based on characteristics of data to be stored in a logical device of said storage apparatus;

allocating a first logical device of predetermined capacity from a storage pool of unallocated logical devices of the storage apparatus to said computer, said capacity being greater than or equal to said lower limit securing capacity and less than or equal to said upper limit securing capacity;

monitoring and periodically obtaining a current capacity utilization of said first logical device allocated to said computer;

estimating a future capacity utilization of said first logical device, said estimated future capacity utilization being calculated from the capacity utilizations periodically obtained for said first logical device;

multiplying the estimated future capacity utilization by the lower limit securing ratio and by the upper limit securing ratio to obtain a lower limit securing capacity and an upper limit securing capacity, respectively;

if the capacity of the allocated first logical device is less than or equal to the upper limit securing capacity, and if the capacity of the allocated first logical device is

greater than or equal to the lower limit securing capacity, retaining the allocation of the first logical device to the computer;

if the capacity of the allocated first logical device is greater than the upper limit securing capacity or less than the lower limit securing capacity, determining whether a change in logical device allocated to the computer can be made;

if it is determined that the change in logical device allocated to the computer can be made, allocating a second logical device of predetermined capacity from the storage pool to said computer, releasing the allocation of the first logical device to said computer, and returning the first logical device to the storage pool; and

if it is determined that the change in logical device allocated to the computer cannot be made, setting in the data management table an indication that the capacity of the allocated first logical device is excessively large if the capacity is greater than the upper limit securing capacity, or an indication that the capacity of the allocated first logical device is excessively small if the capacity is less than the lower limit securing capacity.

15. (New) The managing method according to claim 14, wherein said estimating step is performed by linearly extrapolating the capacity utilization to a future time point from at least two time points of monitoring and obtaining a current capacity utilization.

16. (New) The managing method according to claim 14, wherein if the estimated future capacity utilization is less than a maximum capacity utilization previously obtained for said first logical device by said monitoring and periodically obtaining step, the estimated future capacity utilization is set to a maximum capacity utilization previously obtained.

17. (New) The managing method according to claim 14, further comprising the step of setting the estimated future capacity utilization to the most recently-obtained current capacity utilization.

18. (New) The managing method according to claim 14, wherein if the capacity of said allocated first logical device is greater than the estimated future capacity utilization by a determined amount, the managing method further comprises the step of copying data stored in said first logical device to said second logical device, wherein said copying step is completed before performing said step of releasing the allocation of said first logical device to the computer.

19. (New) The managing method according to claim 14, further comprising the step of reducing the size of a file system made in the first logical device before the data copying is executed.

20. (New) The managing method according to claim 14, wherein said step of calculating said estimated future capacity utilization calculates the estimated future capacity utilization on the basis of the kind of application for utilizing each logical device, access characteristics or the degree of importance of stored data in addition to the capacity utilization of said each logical device.